Estimation of Adult Spring Chinook Returns
to Rapid River Hatchery – 1984

Using the relationship of returning four- and five-year-old adults to the jack return from the same brood year, we have estimated the return of four- and five-year-olds to Rapid River in 1984. The estimation forecasts a probable Rapid River run size over Lower Granite Dam with no in-river fisheries (standardized return) other than the Indian ceremonial and subsistence catch in Zone 6.

The calculated regression equation from data in Table 1 is as follows (x = number of jacks) :

Four-year-olds : jacks (1973-82)
n = 10 r = 0.985
y = 227 + 7.35x (x = 98)

Five-year-olds : jacks (1973-81)
n = 9 r = 0.72
y = 120 + 1.33x (x = 36)

Therefore, the estimated return to Rapid River in 1984 is forecast as follows:

4's in 1984 = 227 + 7.35 (98) = 947

5's in 1984 = 120 + 1.33 (36) = 168

Expected total 1984 adult return = 1,115

If the release of Rapid River Hatchery spring chinook smolts to Hells Canyon in 1981 returns at the same rate as the Rapid River release, we can expect the following return to Hells Canyon in 1984 :

168/2,376,000 x 1,001,700 = 71 five-year-olds
(smolts released to Rapid River) (smolts released to Hells Canyon)

The precision of this forecast is not extremely great, but it does indicate strongly that we will be unable to meet our basic mitigation requirements again this year at Rapid River. The 1984 forecast is similar to that for 1983 which was 120% low (actual run of 1,864). Based on last year's experience, we might expect about 1,800 – 2,000 adult chinook back to Rapid River in 1984. This would again be short of the 3,000 we need just for the basic Rapid River program and the egg take would be less than in 1983 as we do not expect as large a return of five-year-olds as we obtained last year.

In addition to the 3,000 adults needed to supply Rapid River's basic program, we could use an additional 1,000 fish for Pahsimeroi Hatchery, 1,000 for Dworshak and a few hundred for Kooskia National Hatchery. Any surpluses above this number would be used for our egg incubation channels in the Clearwater drainage.

Table 1. Estimated total return over Lower Granite Dam of Rapid River Hatchery spring chinook salmon with no inriver fishery (standardized return).

	Jacks		Four-year-olds		Five-year-olds		
Brood year	Return year	Number	Return year	Number	Return year	Number	Total Return
1970	1973	430	1974	3,003	1975	448	3,3881
1971	1974	637	1975	4,689	1976	1,244	6,570
1972	1974	665	1976	5,842	1977	1,322	7,829
1973	1976	1,915	1977	14,843	1978	2,447	19,205
1974	1977	846	1978	5,158	1979	2,700	8,704
1975	1978	45	1979	677	1980	81	803
1976	1979	393	1980	2,590	1981	273	3,256
1977	1980	789	1981	5,653	1982	671	7,113
1978	1981	338	1982	3,719	1983	1,065	5,122
1979	1982	36	1983	870	1984		
1980	1983	98	1984				
1981	1984						